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Radio Source Counts at 30 GHz

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Abstract. We observe 1,377 NVSS point sources with the Green Bank Telescope (GBT) and Caltech Continuum Backend (CCB) at 31.25 GHz. We find the GBT+CCB provides 0.500 mJy rms sensitivity and a 28 arcsec FWHM beam in a 3.5 GHz band centered on 31.25 GHz. We combine these data with observations of 2,225 point sources by the Owens Valley Radio Observatory 40 m (rms sensitivity 2.5 mJy) to provide the most accurate present determination of the contribution of point sources to 1 cm wavelength cosmic microwave background measurements at small scales (< 5 arcmin). Point sources are the most significant contaminant of this signal, which is expected to be dominated by the Sunyaev-Zel'dovich effect from large galaxy clusters, and has been thus far hinted at, but not yet confirmed by, the Cosmic Background Imager.